Piecing Together the Pelican Puzzle

By Ken Torkelson

Chase Lake National Wildlife Refuge lures thousands of American white pelicans to its nesting grounds each year.

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Until a couple of years ago, Chase Lake National Wildlife Refuge and its colony of American white pelicans were relatively unknown. Then, thanks to two unusual events, both made headlines around the world.

• In late May and early June 2004, about 30,000 pelicans suddenly left the refuge near Medina in western Stutsman County. Biologists were puzzled.

• Then, during the summer of 2005, most of the more than 18,000 adult pelicans at the refuge left after nearly all their chicks died. Again, explanations were hard to come by.

Although some thought the two events could be related, biologists believed otherwise. They pointed out that the 2004 event was an abandonment, in which adult pelicans suddenly departed, leaving behind eggs and possibly live chicks. Conversely, the 2005 dispersal happened after the adults no longer had chicks to care for.

Background

The American white pelican is a large white bird with black wing tips. It weighs about 20 pounds at maturity, and has a long orange bill with a pouch. A ground-nester, the pelican uses sticks, grass and reeds to construct a nest 2-3 feet across. Courtship begins almost immediately after adults arrive at their colony sites around mid-April at Chase Lake NWR. Females typically produce two eggs, and both parents incubate, with one on the nest while the other forages. Eggs hatch after about 30 days, but most times only one chick survives.

Adult pelicans visit shallow marshes, rivers and lake edges within 100 miles to scoop up salamanders, rough fish and crayfish. The food is swallowed and later regurgitated to feed young. Chicks leave the nest at 2-3 weeks of age, gathering with other young in large groups called pods or creches for protection and warmth. A 1982 study of banded pelicans reported the maximum lifespan was 26 years.

Chase Lake NWR has been considered home to the largest nesting colony of white pelicans in North America and, most likely, the world. The U.S. Fish and Wildlife Service has census records dating back to 1972 for the Chase Lake pelicans. Breeding populations range from 6,164 birds in 1974 to 35,466 in 2000.

At Chase Lake, rising water levels the past decade have changed the available nesting habitat. Pelicans traditionally used islands, but in recent years many pairs also nested on a peninsula.

History

Large numbers of pelicans nested at Chase Lake as far back as 1863 when General Sibley was active in the area. However, Medina resident H. H. McCumber noticed in 1905 that the Chase Lake population had declined dramatically due to uncontrolled shooting, so he asked the Biological Survey in Washington, D.C. to establish a bird refuge. Only about 50 pelicans remained in1908 when President Teddy Roosevelt created Chase Lake National Wildlife Refuge as a "reserve and breeding area for native birds."

After its designation as a refuge, things moved along fairly smoothly at Chase Lake for almost 100 years. Sure, there were ups and downs in the pelican population, but mostly minor fluctuations that were no cause for concern.

Recent Developments

Starting in mid-May and continuing into early June 2004, pelicans abandoned their nests and eggs on the peninsula at Chase Lake, where biologists found evidence of coyote depredation. "We knew right away that something was wrong," recalls Mick Erickson, former refuge manager. "In the past, we had been able to walk to within about 25 yards of them before they started getting nervous, but this time we barely got within a quarter-mile."

By early June, an estimated 7,000 pelican nests had been abandoned on the peninsula, leaving a landscape dotted with thousands of white eggs.

In late May, pelicans nesting on the north island were still behaving normally and most had chicks. However, by mid-June, the island was largely deserted and only a few live chicks remained. Researchers aren't certain why adult pelicans left the island, but some possible contributing factors have been suggested. Adults displaced from the peninsula might have tried to settle on the island, creating a disturbance that prompted some island inhabitants to leave.

A more important factor may have been weather. According to Marsha Sovada, U.S. Geological Survey scientist from Northern Prairie Wildlife Research Center, Jamestown, many of the chicks may have died during a stretch of cold, wet and windy weather that persisted from May 29 through June 1. "The chicks were especially vulnerable because most of them had reached the age when the adults no longer brood them," she said. "Once the chicks had died, their parents would have had no reason to stick around." Support for that scenario comes from the Marsh Lake pelican colony in western Minnesota, where about 800 pelican chicks were found dead on June 2, the day after this same storm system left the area.

Although the abandonment is believed to be a first for Chase Lake, pelican researchers say it's not unprecedented. Colonies in Western states have on occasion been abandoned by adult pelicans because of extreme reductions in food resources due to drought conditions. Productivity of pelican colonies can be affected by many factors. In addition to predator disturbance and severe weather, as seen at Chase Lake, productivity can be influenced by human disturbance, reduced food supplies, disease or exposure to toxicants.

Over the winter of 2004-05, biologists from the U.S. Fish and Wildlife Service, U.S. Geological Survey and the North Dakota Game and Fish Department worked on plans for the upcoming pelican nesting season. They agreed to restrict human access to nesting sites, erect a fence to keep predators away from the peninsula site, set up remote monitoring equipment, hire and equip human observers with binoculars and spotting scopes, deploy Global Positioning System tracking equipment on several pelicans to follow movements, continue banding pelicans, and continue monitoring effects of West Nile virus.

"We decided to minimize human disturbance in the pelican colony as much as possible," said Kim Hanson, project leader of Arrowwood National Wildlife Refuge, which administers Chase Lake. "They are somewhat more sensitive during the early stages of nesting, and we wanted to eliminate the risk of human disturbance causing abandonment. At the same time, we wanted to keep a close eye on them."

Biologists were relieved when pelicans began returning to Chase Lake NWR in early April 2005. Eventually, more than 18,000 pelicans showed up. The new arrivals avoided the peninsula, but nests were built on islands, eggs were laid and chicks hatched. Things appeared normal.

But not for long.

During a mid-June visit to the north island, biologists found about half the chicks dead. Carcasses weren't fresh enough to determine cause of death, but most of the dead chicks were 2-3 weeks old, the age when brooding by parents tapers off. These chicks would have been particularly susceptible to the cool,

wet and windy conditions recorded about that time.

Then, following a severe storm over Independence Day weekend, observers discovered another catastrophic loss of chicks. Again, carcasses were too old to necropsy, but there were telltale signs that pointed to the storm. Many of the dead chicks were stacked in piles, probably as a result of crowding and trampling during 60 mile per hour winds. Following the tough weather, most of the adults without chicks to care for simply dispersed.

"We were very disappointed," said Dave Bolin, Chase Lake operations specialist at the time. "We had such high hopes after the birds returned in the spring and appeared to be having a normal nesting season."

The Big Picture

Conservation agency partners gathered again in early 2006, this time inviting pelican researchers from surrounding states and provinces, in hopes of getting a look at how pelicans were doing on a continental scale. Participants agreed that little is known about pelicans and their habitat, and that the species can't be effectively managed until more is learned. There has been no continent-wide pelican census for about 25 years. Biologists are unsure how many pelicans live in North America, or the number of colonies and their locations.

"We've got a long way to go to fill in the holes in our pelican knowledge," said Tommy King, U.S. Department of Agriculture-Wildlife Services scientist from the National Wildlife Research Center at Mississippi State University. He said most of the approximately 60 known pelican colonies in North America are not closely watched. "These colonies are usually quite remote and hard to visit, the species is a low priority for some managers, and there are many different agencies, groups and political boundaries to deal with," he said.

Biologists believe the continental pelican population may have been increasing for the past few decades, even though some individual colonies may be shrinking or disappearing.

If Chase Lake is only one piece of the pelican puzzle, why should biologists be concerned? USGS scientist Sovada pointed out that Chase Lake, together with Bitter Lake in northeastern South Dakota, Marsh Lake in west central Minnesota, and Medicine Lake National Wildlife Refuge in northeastern Montana, host nearly half the known pelican populations in North America. "Sustained productivity at these colonies is crucial to the health of the entire continental population," she said.

Disease

Although West Nile virus had only been found in northern plains pelicans since 2002, it is certainly causing problems. Dr. Kathryn Converse of the USGS National Wildlife Health Center in Madison, Wisconsin said the disease appears to be the leading cause of juvenile pelican deaths. "Many of the chicks that were banded died," she said. Other diseases such as salmonella and botulism type C have been detected in nesting pelicans for a long time, but "there have been more juvenile

The many sloughs that dot North Dakota's countryside offer American white pelicans places to loaf and feed.

pelican mortalities in the past three years than the previous 30 years."

Preliminary results of the USGS study of West Nile virus and Northern Plains pelicans indicate that the virus "has the potential to severely impact pelican populations."

What to Do

Conservation partners made four recommendations concerning white pelicans: Conduct a continent-wide status assessment as soon as possible, which would include a census of existing colonies and a search for new ones; continue monitoring the effects of West Nile virus, which has claimed up to half of the pelican chicks in some colonies since 2002; continue banding at key northern prairie pelican colonies; and measure productivity at selected colonies.

At Chase Lake, biologists will intensify their monitoring efforts, while continuing most of the precautions begun last year. "We will have two people on site most days this summer, instead of just one," said Tomi Buskness, refuge manager. Other plans: Service personnel will again close the nesting area to the public, erect a predator fence across the peninsula nesting site, and work with USGS and USDA partners to band pelican chicks. For their part, USGS scientists will again install remote camera equipment, monitor effects of West Nile virus, measure productivity, and track pelicans with GPS satellite transmitters. "We believe these measures will help us protect the pelicans, monitor their health, follow their movements and learn more about them," Buskness said.

No matter what the Chase Lake pelicans do this year, a couple of things are certain. Fish and Wildlife Service scientists and partners will learn from it, and be better able to manage the species in the future.

And you'll probably see more headlines about Chase Lake and its pelicans.

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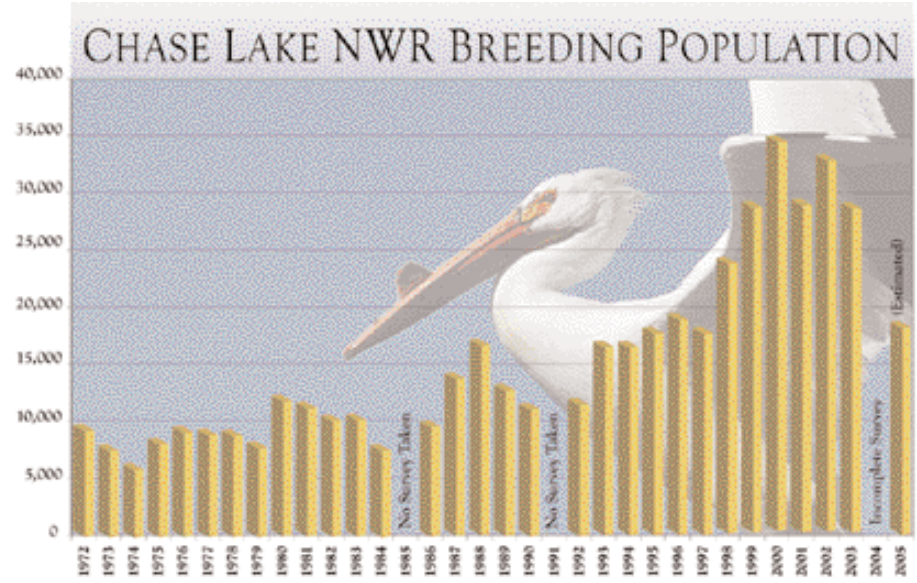
This graphic clearly shows how the American white pelican breeding population at Chase Lake National Wildlife Refuge has climbed over the years.



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White pelican chicks may be homely, but they grow into big birds that are a pleasure to view on the wing.